

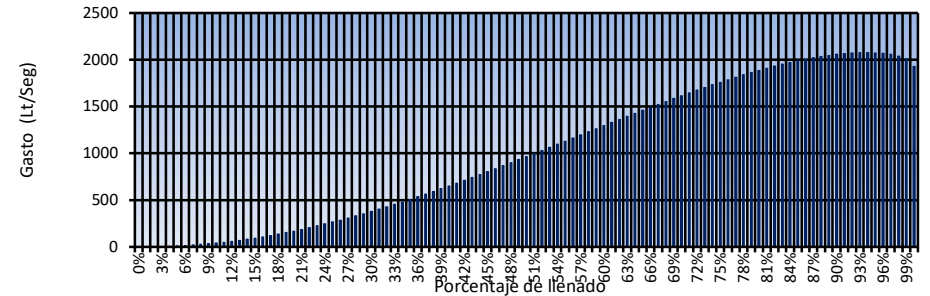
COMPORTAMIENTO HIDRAULICO

TUBERIA A PRESIÓN ATMOSFÉRICA

FORMULA DE MANNING

PROYECTO :								
TRAMO :								
FECHA :			ELABORO :					
Número Manning (n) =		0.009						
Pendiente del tubo (S) =		0.0050						
Diámetro (D) =		36		inch		0.9144		m
radio=		18		inch		0.4572		m
Area de tubo Ac=		1017.876		in^2		0.65669		m2
Tirante (m)	% llenado	Q (Lt/Seg)	Velocidad m/seg	α	n mínimo	A (m2)	R (m)	EFICIENCIA
0.0091	1%	0.29	0.26	0.20033	n=0.012	0.0011	0.0061	0.0%
0.0183	2%	1.30	0.41	0.28379	n=0.012	0.0031	0.0121	0.1%
0.0274	3%	3.10	0.54	0.34817	n=0.012	0.0057	0.0180	0.1%
0.0366	4%	5.75	0.65	0.40272	n=0.010	0.0088	0.0239	0.3%
0.0457	5%	9.26	0.75	0.45103	n=0.010	0.0123	0.0298	0.4%
0.0549	6%	13.66	0.85	0.49493	n=0.010	0.0161	0.0355	0.7%
0.0640	7%	18.96	0.94	0.53553	n=0.010	0.0202	0.0413	0.9%
0.0732	8%	25.16	1.02	0.57351	n=0.010	0.0246	0.0469	1.2%
0.0823	9%	32.26	1.10	0.60939	n=0.010	0.0293	0.0525	1.6%
0.0914	10%	40.27	1.18	0.64350	n=0.010	0.0342	0.0581	1.9%
0.1006	11%	49.19	1.25	0.67613	n=0.010	0.0393	0.0636	2.4%
0.1097	12%	59.00	1.32	0.70748	n=0.010	0.0446	0.0690	2.8%
0.1189	13%	69.70	1.39	0.73773	n=0.010	0.0502	0.0744	3.4%
0.1280	14%	81.30	1.45	0.76699	n=0.010	0.0559	0.0797	3.9%
0.1372	15%	93.77	1.52	0.79540	n=0.010	0.0618	0.0849	4.5%
0.1463	16%	107.10	1.58	0.82303	n=0.010	0.0678	0.0901	5.2%
0.1554	17%	121.30	1.64	0.84998	n=0.010	0.0740	0.0952	5.8%
0.1646	18%	136.34	1.70	0.87630	n=0.010	0.0804	0.1003	6.6%
0.1737	19%	152.22	1.75	0.90205	n=0.010	0.0869	0.1053	7.3%
0.1829	20%	168.92	1.81	0.92730	n=0.010	0.0935	0.1103	8.1%
0.1920	21%	186.43	1.86	0.95207	n=0.010	0.1002	0.1152	9.0%
0.2012	22%	204.73	1.91	0.97641	n=0.010	0.1071	0.1200	9.9%
0.2103	23%	223.81	1.96	1.00036	n=0.010	0.1141	0.1247	10.8%
0.2195	24%	243.65	2.01	1.02395	n=0.010	0.1212	0.1294	11.7%
0.2286	25%	264.23	2.06	1.04720	n=0.010	0.1284	0.1341	12.7%
0.2377	26%	285.55	2.10	1.07014	n=0.010	0.1357	0.1386	13.8%
0.2469	27%	307.57	2.15	1.09280	n=0.010	0.1431	0.1432	14.8%
0.2560	28%	330.30	2.19	1.11520	n=0.010	0.1505	0.1476	15.9%
0.2652	29%	353.69	2.24	1.13735	n=0.010	0.1581	0.1520	17.0%
0.2743	30%	377.75	2.28	1.15928	n=0.010	0.1657	0.1563	18.2%
0.2835	31%	402.44	2.32	1.18100	n=0.010	0.1734	0.1606	19.4%
0.2926	32%	427.75	2.36	1.20253	n=0.010	0.1812	0.1648	20.6%
0.3018	33%	453.67	2.40	1.22388	n=0.010	0.1890	0.1689	21.9%
0.3109	34%	480.15	2.44	1.24507	n=0.010	0.1969	0.1729	23.1%
0.3200	35%	507.20	2.48	1.26610	n=0.009	0.2048	0.1769	24.4%
0.3292	36%	534.78	2.51	1.28700	n=0.009	0.2128	0.1809	25.8%
0.3383	37%	562.88	2.55	1.30777	n=0.009	0.2209	0.1847	27.1%
0.3475	38%	591.47	2.58	1.32843	n=0.009	0.2290	0.1885	28.5%
0.3566	39%	620.53	2.62	1.34898	n=0.009	0.2371	0.1922	29.9%
0.3658	40%	650.03	2.65	1.36944	n=0.009	0.2453	0.1959	31.3%
0.3749	41%	679.97	2.68	1.38981	n=0.009	0.2535	0.1995	32.8%
0.3840	42%	710.30	2.71	1.41011	n=0.009	0.2617	0.2030	34.2%
0.3932	43%	741.01	2.74	1.43033	n=0.009	0.2700	0.2064	35.7%
0.4023	44%	772.07	2.77	1.45051	n=0.009	0.2783	0.2098	37.2%
0.4115	45%	803.47	2.80	1.47063	n=0.009	0.2866	0.2131	38.7%
0.4206	46%	835.16	2.83	1.49071	n=0.009	0.2949	0.2164	40.3%
0.4298	47%	867.14	2.86	1.51076	n=0.009	0.3033	0.2195	41.8%
0.4389	48%	899.37	2.89	1.53079	n=0.009	0.3116	0.2226	43.3%

Gasto / Tirante hidráulico



0.4481	49%	931.82	2.91	1.55079	n=0.009	0.3200	0.2257	44.9%
0.4572	50%	964.48	2.94	1.57080	n=0.009	0.3283	0.2286	46.5%
0.4663	51%	997.31	2.96	1.59080	n=0.009	0.3367	0.2315	48.1%
0.4755	52%	1030.28	2.99	1.61081	n=0.009	0.3451	0.2343	49.7%
0.4846	53%	1063.38	3.01	1.63083	n=0.009	0.3534	0.2370	51.2%
0.4938	54%	1096.56	3.03	1.65088	n=0.009	0.3618	0.2396	52.8%
0.5029	55%	1129.81	3.05	1.67096	n=0.009	0.3701	0.2422	54.5%
0.5121	56%	1163.09	3.07	1.69109	n=0.009	0.3784	0.2447	56.1%
0.5212	57%	1196.38	3.09	1.71126	n=0.009	0.3867	0.2471	57.7%
0.5304	58%	1229.63	3.11	1.73149	n=0.009	0.3950	0.2495	59.3%
0.5395	59%	1262.84	3.13	1.75178	n=0.009	0.4032	0.2517	60.9%
0.5486	60%	1295.95	3.15	1.77215	n=0.009	0.4114	0.2539	62.5%
0.5578	61%	1328.94	3.17	1.79261	n=0.009	0.4196	0.2560	64.0%
0.5669	62%	1361.79	3.18	1.81316	n=0.009	0.4277	0.2580	65.6%
0.5761	63%	1394.45	3.20	1.83382	n=0.009	0.4358	0.2599	67.2%
0.5852	64%	1426.89	3.21	1.85459	n=0.009	0.4439	0.2617	68.8%
0.5944	65%	1459.08	3.23	1.87549	n=0.009	0.4519	0.2635	70.3%
0.6035	66%	1490.98	3.24	1.89653	n=0.009	0.4598	0.2651	71.9%
0.6126	67%	1522.56	3.26	1.91771	n=0.009	0.4677	0.2667	73.4%
0.6218	68%	1553.78	3.27	1.93906	n=0.009	0.4755	0.2682	74.9%
0.6309	69%	1584.61	3.28	1.96059	n=0.009	0.4833	0.2696	76.4%
0.6401	70%	1614.99	3.29	1.98231	n=0.009	0.4910	0.2709	77.8%
0.6492	71%	1644.91	3.30	2.00424	n=0.009	0.4986	0.2721	79.3%
0.6584	72%	1674.31	3.31	2.02640	n=0.009	0.5062	0.2732	80.7%
0.6675	73%	1703.14	3.32	2.04879	n=0.009	0.5136	0.2742	82.1%
0.6767	74%	1731.38	3.32	2.07145	n=0.009	0.5210	0.2751	83.4%
0.6858	75%	1758.97	3.33	2.09440	n=0.009	0.5283	0.2759	84.8%
0.6949	76%	1785.87	3.33	2.11765	n=0.009	0.5355	0.2765	86.1%
0.7041	77%	1812.02	3.34	2.14123	n=0.009	0.5426	0.2771	87.3%
0.7132	78%	1837.38	3.34	2.16518	n=0.009	0.5496	0.2776	88.6%
0.7224	79%	1861.89	3.35	2.18953	n=0.009	0.5564	0.2779	89.7%
0.7315	80%	1885.49	3.35	2.21430	n=0.009	0.5632	0.2782	90.9%
0.7407	81%	1908.13	3.35	2.23954	n=0.009	0.5698	0.2783	92.0%
0.7498	82%	1929.74	3.35	2.26529	n=0.009	0.5763	0.2782	93.0%
0.7590	83%	1950.25	3.35	2.29162	n=0.009	0.5827	0.2781	94.0%
0.7681	84%	1969.59	3.34	2.31856	n=0.009	0.5889	0.2778	94.9%
0.7772	85%	1987.67	3.34	2.34619	n=0.009	0.5949	0.2773	95.8%
0.7864	86%	2004.42	3.34	2.37460	n=0.009	0.6008	0.2767	96.6%
0.7955	87%	2019.73	3.33	2.40387	n=0.009	0.6065	0.2759	97.3%
0.8047	88%	2033.50	3.32	2.43411	n=0.009	0.6121	0.2750	98.0%
0.8138	89%	2045.59	3.31	2.46546	n=0.009	0.6174	0.2739	98.6%
0.8230	90%	2055.88	3.30	2.49809	n=0.009	0.6225	0.2725	99.1%
0.8321	91%	2064.18	3.29	2.53221	n=0.009	0.6274	0.2710	99.5%
0.8412	92%	2070.31	3.28	2.56808	n=0.009	0.6321	0.2692	99.8%
0.8504	93%	2074.00	3.26	2.60607	n=0.009	0.6365	0.2671	100.0%
0.8595	94%	2074.94	3.24	2.64666	n=0.009	0.6406	0.2647	100.0%
0.8687	95%	2072.69	3.22	2.69057	n=0.009	0.6444	0.2619	99.9%
0.8778	96%	2066.63	3.19	2.73888	n=0.009	0.6479	0.2587	99.6%
0.8870	97%	2055.78	3.16	2.79343	n=0.009	0.6510	0.2548	99.1%
0.8961	98%	2038.32	3.12	2.85780	n=0.009	0.6536	0.2501	98.2%
0.9053	99%	2009.90	3.07	2.94126	n=0.009	0.6556	0.2438	96.9%
0.9144	100%	1928.96	2.94	3.14159	n=0.009	0.6567	0.2286	93.0%

El 80 % Se considera la capacidad máxima para conducir el flujo a presión atmosférica

0.00742082

Esta es la capacidad máxima de la tubería y donde alcanza su mayor eficiencia de conducción (ya se considera tubería a presión).